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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/767,588
Filing Date: January 23, 2001
Appellant(s): NIWA ET AL.

MAILED

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GROUP 2800

Nathaniel T. Wallace
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 08/12/2004.

A statement identifying the real party in interest is contained in the brief.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 1-3, 5,6,8-11 and 16-21 are pending, stand rejected and are under appeal.

The status of claim 8 is missing from the applicant's brief.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-3,5,6,8-11 and 16-21 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) ClaimsAppealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,304,308	Saito et al.	10-2001
4,820,025	Nakanowatari	04-1989
5,798,813	Ohashi	08-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Objections

Claims 6 and 9 are objected as follows:

The term 'the display area in claim 6 has no antecedent basis.

The terms 'the gap' and 'the pollutant' have no antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1,9,17, 20-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. (Saito) (U.S.Patent No. 6,304,308).

As to claims 1 and 9: Saito discloses a liquid crystal display having a first substrate (DSUB) and a second substrate (USUB) which are disposed with a predetermined gap (Figs. 1-8), in which liquid crystal (LC) is sealed in the gap, comprising post structures (SPC-P) for controlling the gap between the first substrate and the second substrate; a sealing material (SL) provided outside a display area for sealing the liquid crystal in the gap, and forming an open injection hole (INJ) for injecting said liquid crystal; an end-sealing material (SL) for sealing the injection hole (INJ) after said liquid crystal is sealed in; and injection hole post structures (Fig. 8) and (col. 9, lines 2-4) provided in an area near the injection hole, for dividing the injection hole into a plurality of portions by using the same material as the post structures (col. 7, lines 49-52) and (col. 8, lines 45-48). Saito discloses a strip spacer and the pole spacers are made of a material such as negative resist BPR-113 (col. 7, lines 49-52) and the strip spacer (SPC-S) formed at the outer periphery of the display area for use as a liquid crystal injection port (col. 8, lines 45-48).

Saito discloses a penetration suppressor (sealant SL). Sealants are used for suppressing the penetration of a pollutant generated from the connection portion (INJ) into the display area, as recited in claim 6. Saito also discloses post

members (SPC-P) having a pattern (Fig. 4) for controlling the gap, as recited in claim 9.

As to claim 20: Due to the arrangement of the shield film (SHF) and the protective film (PSV1) and the formation of the seal (SL) (penetration suppresser) and the injection hole post structures on top of the shield film and the protective film, it can clearly be seen from Fig. 1 that the penetration suppresser (SL) and the injection hole post structures (INJ) are formed with a height lower than a height of a gap formed between the pair of substrates (SUB1 and SUB2).

As to claims 17 and 21: Saito discloses that the first substrate (SUB2) is a color filter substrate and the second substrate (SUB1) is an active matrix substrate (col. 10, lines 42-43).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3, 5 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito.

a. As to claims 3, 5 and 10-11: Saito discloses that the injection hole post structures are formed at a position where part of them are in contact with the end-sealing material (Fig. 4) and the height of these post structures is lower than the SPC-S height as can be seen in Fig. 8 and hence the post structure height is

less than the gap between the substrates. The effect of liquid crystal deterioration, thus the charge retention capacity, is fully disclosed in (col. 7, lines 49-60). The penetration suppressor is a pair of post structures which is close to the projecting portion and extending from the vicinity of the substrate end in the injection hole to the display area (Fig. 4). The plurality of injection hole post structures forms plurality of rows toward the display area from a position close to the substrate end in the injection hole (Fig. 8). Since the injection hole is filled with end-sealing material and the injection hole post structures are inside the injection hole, they are in contact with the end-sealing material.

Saito does not explicitly state the deterioration of the charge retention of the liquid crystal from the material of the injection hole post structure.

However, Saito does disclose the material of the pole spacers dissolving into the liquid crystal material and will not exhibit imbibition and swelling. The sealing material which is deposited along the outer edges is disclosed in (col. 8, lines 21-22).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the configuration of the injection post structures to eliminate visualization irregularities during displaying of on-screen images, including flutter, moiré, streaking and pixel jitter at certain intensities (col. 5, lines 11-17).

14. Claims 2 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Ohashi et al. (Ohashi) (U.S. Patent No. 5,798,813).

Although Saito discloses injection port (INJ) may be replaced with an array of two or more liquid crystal injection ports (col. 9, lines 2-4), Saito does not disclose the width of these injection holes, nor does he disclose the separation distance of these holes from the display area.

Ohashi on the other hand, in disclosing a liquid crystal cell, discloses several dam seals (36a) in the injection port area (36) having a pitch of 1.5mm to 3mm, with a diameter of 0.25mm. The distance between these seals and the display area is shown as 'P' (Figs. 17 and 18) and disclosed in (col. 8, lines 48-50). From Figs 17 and 18 it can be seen that the space formed by the plurality of the injection hole post structures (dam seals) (0.3mm) is shorter than the double the distance (P). Since the seals have a pitch of 1.5mm to 3mm and the space formed by the injection post structures is 0.3mm, it is at least double the predetermined expansion distance of a pollutant. (Note: as pointed out in the claim objections above, the predetermined expansion distance is not defined and hence it could be taken as half of either the pitch distance or half of the space formed by the injection post structures).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the configuration of the injection post structures minimize the turbulence in a flow of the liquid crystal and thus making the flow uniform and the liquid crystal is filled into the cell gap smoothly and uniformly (col. 8, lines 48-56). Ohashi discloses the hardening of the resin film by ultraviolet rays (col. 5, line 12).

15. Claims 6, 8, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Nakanowatari (U.S. Patent No. 4,820,025).

As to claim 6: Saito discloses a sealing material (SL) for connecting a pair of substrates outside the display area and forming an open injection hole (INJ) for injecting liquid crystal, an end-sealing material (Fig. 4) for sealing the injection hole after the liquid crystal is injected (col. 11, lines 61-62), a penetration suppressor (SPC-S or the optical block material col. 4, lines 6-9) for suppressing the penetration of pollutants into the display area (col. 4, lines 12-24).

However, Saito does not disclose the bending of the seal material at an acute angle.

Nakanowatari in disclosing a liquid crystal cell, discloses that the corner portions of the substrates in which the injection hole is formed is cut away at an acute angle (the outside angle), thus the seal material that seals the injection port is also formed at an acute angle (Fig. 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the specific sealing configuration that is cut at an acute angle to enable the injection hole to come close to the bottom of the tank of the liquid crystal, thereby enabling effective use of an expensive liquid crystal (col. 2, lines 12-26).

As to claim 8: The combined teachings of Saito and Nakanowatari disclose that the penetration suppressor (SPC-S) (Figs. 4 and 8) is a pair of post structures which is close to the projecting portion (Fig. 3 of Nakanowatari) and extending from the vicinity of the substrate end in the injection hole to the display area.

As to claim 18: In Fig. 1, Saito teaches that the penetration suppressor (SPC-S) is formed with a height lower than a height of a gap formed between the substrates.

As to claim 19: Saito discloses that the first substrate (SUB2) is a color filter substrate and the second substrate (SUB1) is an active matrix substrate (col. 10, lines 42-43).

(11) Response to Argument

It is respectfully suggested that the following figures are applicable to the case and request that the appeal board review these figures carefully before the prosecution:

Applicant's figures 1A and 4

Against

Figs. 1 and 8 of Saito (U.S.Patent No. 6,304,308) and
Fig. 3 of Nakanowatari (U.S.Patent No. 4,820,025)

Issue I

A. Whether Saito et al. (U.S. Patent No. 6,304,308) renders obvious Appellant's claim 1.

Applicant's arguments are as follows:

1. The Saito reference is legally deficient to establish a *prima facie* case of obviousness against claim 1 because Saito does not teach or suggest "a sealing material provided outside a display area for sealing said liquid crystal in said gap, and forming an open injection hole for injecting said liquid crystal therethrough" as claimed in Claim 1 (page 6, lines 4-6, lines 9-11 and 19-22 of the Brief).

2. Saito teaches a strip spacer (SPC-S) having an injection port. The strip spacer material of Saito does not perform a sealing function. Nowhere does Saito teach or suggest that the seal material comprises an injection port.

Examiner's response to Applicant's argument is as follows:

1. First, the Examiner would like to point out that the current claims are device claims and not method claims. Hence, once the device is assembled there is no way to distinguish whether the liquid crystal material is injected before or after the sealing material is deposited.

Saito clearly teaches a sealing material (SL) (heavy cross-hatched line in Fig. 8, near item marked SPC-S) outside the display area. Saito refers to sealing material (SL) in the text (col. 6, line 26, col. 7, lines 1-9, col. 11, lines 30-32) and teaches that a seal material is coated at the outer edge of the strip spacer SPC-S (col. 11, lines 30-32) but does not label it in Fig. 8. Since, the sealing material (SL) is close to SPC-S, it was identified as such in the office action. The display area is designated as AR by Saito in Fig. 8. The sealing and injection of liquid crystal method and the resulting cell gap is disclosed quite explicitly in (col. 6, lines 56-67) and (col. 7, lines 1-9).

In addition, Saito clearly teaches an injection port (INJ) and teaches that injecting a chosen liquid crystal material via the opening (INJ) (col. 11, lines 61-62). Hence the applicant's arguments are mute.

2. While the examiner agrees that the strip spacer (SPC-S) does not perform the sealing function, but respectfully point out that the sealing material (SL) performs the sealing function and since it is closer to the strip spacer (SPC-S) and was not labelled in Fig. 8, the Examiner used the combination of the sealing material (SL) and the strip spacer (SPC-S) as having the same function.

In Fig. 8, Saito clearly suggest an injection port (INJ) in the sealing material (heavy cross-hatched line, no labelling). Hence, the applicant's arguments are mute.

Issue II

B. Whether the combined teachings of Saito et al. (U.S.Patent No. 6,304,308) and Nakanowatari (U.S.Patent No. 4,820,025) renders obvious Appellant's Claim 6.

Applicant's arguments are as follows:

1. With respect to claim 6, the combined teachings of Saito and Nakanowatari fail to teach or suggest "said sealing material at an acute angle when said injection hole is formed" (page 6, lines 6-8 of the brief).

2. Saito clearly identifies the heavy lines in injection port of Fig. 8 as seal material (SL), wherein the seal material is deposited after liquid crystal injection and seals the injection hole in the strip spacer (page 7, lines 8-12).

Examiner's response to the Applicant's argument:

1. The acute angle is defined by the applicant as the angle that is formed in the inside of the bend portion (please see Fig. 4 of the instant application). With the same definition, it can clearly be seen from Fig. 3 of Nakanowatari that the sealing material (3) has also an acute angle formed in the inside portion of the bend portion. Hence, Nakanowatari's teachings are directly applicable.

2. It is respectfully pointed out that the instant claims are device claims and not method claims as pointed out earlier. Hence, the injection of liquid crystal either before or after the seal material is irrelevant.

Issue III

C. Whether Saito et al. (U.S.Patent No. 6,304,308) anticipates Appellant's Claim 9.

Applicant's arguments are as follows:

1. Saito fails to teach the claimed device including "a sealing material provided outside a display area for sealing said liquid crystal in said gap, and forming an open injection hole for injecting said liquid crystal therethrough" (page 9, lines 4-6 of the brief).

2. As stated with respect to Claim 1, Saito clearly identifies the heavy lines in the injection port of Figure 8 as seal material (SL), wherein the seal material (SL) is deposited after liquid crystal injection (see col. 8 lines 63-65) and seals the injection hole in the strip spacer (SPC-S) (see col. 8, lines 63 to col. 9, line 6, and col. 11, lines 60-65). Saito does not teach or suggest that the seal material (SL) is deposited so as to form an injection port for injecting liquid crystal therethrough, because, among other things, the liquid crystal has already been injected when the seal material (SL) is deposited. Thus, Saito does not teach "a sealing material provided outside a display area for sealing said liquid crystal in said gap, and forming an open injection hole for injecting said liquid crystal therethrough" as claimed in Claim 9. Therefore, Saito fails to teach all the limitations of Claim 9. (page 9, lines 15-22 and Page 10, lines 1-2 of the brief).

Examiner's response to the Applicant's arguments:

1. First, the Examiner would like to point out that the current claims are device claims and not method claims. Hence, once the device is assembled there is no way to distinguish whether the liquid crystal material is injected before or after the sealing material is deposited.

Saito clearly teaches a sealing material (SL) (heavy cross-hatched line in Fig. 8, near item marked SPC-S) outside the display area. Saito refers to sealing material (SL) in the text (col. 6, line 26, col. 7, lines 1-9, col. 11, lines 30-32) and teaches that a seal material is coated at the outer edge of the strip spacer SPC-S (col. 11, lines 30-32) but does not label it in Fig. 8. Since, the sealing material (SL) is close to SPC-S, it was identified as such in the office action. The display area is designated as AR by Saito in Fig. 8. The sealing and injection of liquid crystal method and the resulting cell gap is disclosed quite explicitly in (col. 6, lines 56-67) and (col. 7, lines 1-9).

In addition, Saito clearly teaches an injection port (INJ) and teaches that injecting a chosen liquid crystal material via the opening (INJ) (col. 11, lines 61-62). Hence the applicant's arguments are mute.

2. It is respectfully pointed out that the instant claims are device claims and not method claims as pointed out earlier. Hence, the injection of liquid crystal either before or after the seal material is irrelevant.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Prasad R. Akkapeddi
October 19, 2004

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